

# Lightweight, Damage-Tolerant Radiator for In-Space Power and Propulsion

Completed Technology Project (2011 - 2015)



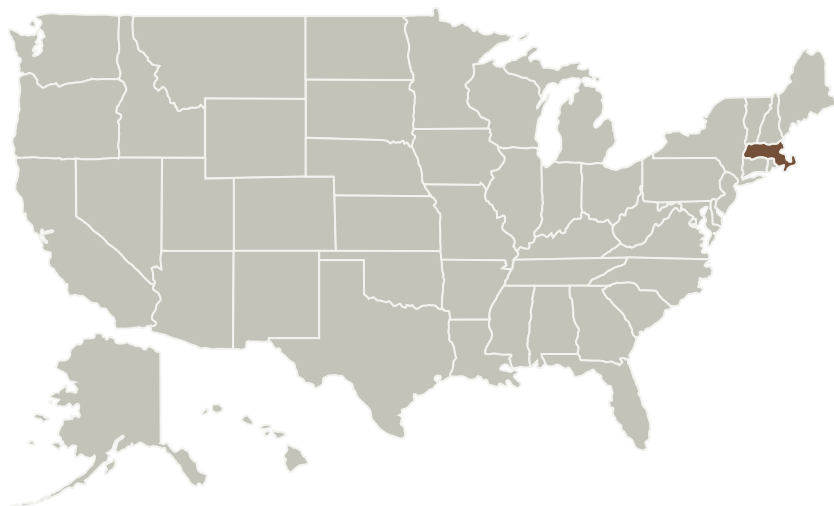
## Project Introduction

Nuclear-electric propulsion promises numerous advantages over other in-space propulsion technologies. However, one serious limitation is the mass of the radiator needed for the energy conversion system; the radiator can approach 40% of the vehicle's mass. A novel concept for a lightweight, damage-tolerant thermal radiator was developed at the University of Massachusetts. Preliminary models showed that this concept has the potential to meet or exceed the targets for radiated power per unit mass and per unit area that have been established by NASA for nuclear-electric spacecraft, significantly exceeding the performance of current radiators. It is proposed to use that preliminary work as the basis for designing a more refined implementation, constructing a laboratory model employing the novel architecture, testing it in vacuum chambers at NASA MSFC, and validating the modeled performance.

## Anticipated Benefits

This project leverages preliminary work as the basis for designing a more refined implementation of lightweight, damage-tolerant thermal radiator for nuclear-electric propulsion.

## Primary U.S. Work Locations and Key Partners



Project Image Lightweight, Damage-Tolerant Radiator for In-Space Power and Propulsion

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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Responsible Program:

Space Technology Research Grants

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Organizations Performing Work	Role	Type	Location
University of Massachusetts-Amherst(UMASS)	Supporting Organization	Academia	Amherst, Massachusetts

## Primary U.S. Work Locations

Massachusetts

## Images



4215-1363187820329.jpg

Project Image Lightweight, Damage-Tolerant Radiator for In-Space Power and Propulsion  
(<https://techport.nasa.gov/image/1787>)

## Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

## Project Management

### Program Director:

Claudia M Meyer

### Program Manager:

Hung D Nguyen

### Principal Investigator:

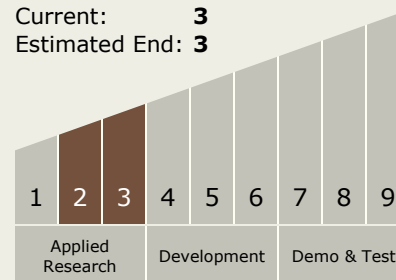
Robert W Hyers

### Co-Investigator:

Briana N Tomboulion

## Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3



## Technology Areas

### Primary:

- TX01 Propulsion Systems
  - TX01.4 Advanced Propulsion
    - TX01.4.2 Electromagnetic Tethers